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DEVICE FOR TREATING INCINERATOR FLY ASH  
[Shokyakuro ni okeru hikai shori sochi]

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[Claims]

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[Claim 1] A device for treating incinerator fly ash, wherein an incinerator-side dust collector and a wet gas washer are disposed along an exhaust path of incinerator exhaust gas emitted from an incinerator body in order from the incinerator body side, an ash melting furnace for heating and melting fly ash that is caught and supplied by the incinerator-side dust collector and an ash melting furnace-side dust collector for collecting fly ash from molten exhaust gas emitted from the ash melting furnace are provided, and a combined exhaust gas pipe that introduces molten exhaust gas that is emitted from the ash melting furnace-side dust collector into an inlet of the wet gas washer.

[Claim 2] The device for treating incinerator fly ash according to Claim 1, wherein the incinerator-side dust collector is a dry filtration dust collector, and only auxiliary agents and activated carbon in the exhaust gas are blown into the inlet by the dry filtration dust collector, thereby collecting dioxin and fly ash.

[Claim 3] The device for treating incinerator fly ash according to Claim 2, wherein a denitrating device is provided to the exhaust gas outlet of the wet gas washer with an exhaust gas reheater, which has as a heating source a heat transfer medium of a boiler that is attached to the incinerator body interposed therebetween.

[Claim 4] The device for treating incinerator fly ash according

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\* Claim and paragraph numbers correspond to those in the foreign text.

to Claim 1, wherein the incinerator-side dust collector is an electrostatic dust collector, and a dry filtration dust collector for collecting dioxin that collects dioxin is disposed to the exhaust gas outlet of the wet gas washer, only auxiliary agents and activated carbon being blown in through the inlet.

[Claim 5] The device for treating incinerator fly ash according to Claim 4, wherein a denitrating device is interposed between the electrostatic dust collector and the wet gas washer.

[Claim 6] The device for treating incinerator fly ash according to any one of Claims 1-5, wherein a main ash supply apparatus that supplies main ash that is emitted from the incinerator body to the ash melting furnace is provided and fly ash is heated and melted together with the main ash in the ash melting furnace.

[Detailed Description of the Invention]

[0001] [Industrial Field of Application]

The present invention relates to a device for treating incinerator fly ash that is captured by a dust collector accompanying exhaust gas during incineration of municipal waste and the like.

[0002] [Prior Art]

Cement solidification treatment has commonly been conventionally used as a method for treating fly ash, but since allocation of landfill space has become more difficult in recent years, demand for reduction in volume of incineration residue has risen. For this reason, consideration has been given to melting fly ash as this has a

significant volume-reducing in fact, in lieu of cementifying, which has a large solidification volume.

[0003] The flow of processes for melting fly ash in a conventional waste incineration facility is as shown in FIG. 5. Specifically, the exhaust gas that is emitted from an incinerator body 1 via a boiler 2 is cooled by a temperature adjusting tower 3, whereafter chemical agents comprising slaked lime, auxiliary agents, and activated carbon are added, and fly ash in the exhaust gases, reacted salts contained therein ( $\text{CaCl}_2$ ,  $\text{Ca}_2\text{SO}_4$ , etc.), unreacted agents ( $\text{Ca}(\text{OH})_2$ , etc.), fly ash [sic], collected heavy metals, and the like are collected by an incinerator-side dry filtration dust collector (bag filter) 4. The exhaust gas emitted from the incinerator-side dust collector 4 is emitted from a chimney 6 as purified gas after nitrogen oxides have been eliminated by a catalytic denitrating device 5.

[0004] On the other hand, fly ash that is collected by the incinerator-side dust collector 4 and the temperature adjusting tower 3 is introduced into an ashmelting furnace 7 either together with the main ash emitted from the incinerator body 1 or by itself, where molten salt and slag are produced and either disposed of as waste or recycled. After the molten exhaust gas which is being emitted by the ash melting furnace 7 has been cooled in the temperature adjusting tower 8, a chemical agent comprising slaked lime, auxiliary agents, and activated carbon is added, and fly ash, reacted salts, unreacted

agents, fly ash [sic], collected heavy metals, and the like are collected by an ash melting incinerator-side dry filtration dust collector (bag filter) 9. The fly ash and other substances which have been collected are detoxified using either a cement solidification method or chelation with an ash detoxifying apparatus 10. Exhaust gas that has been emitted from the melting furnace-side dust collector 9 is emitted from the chimney 6 as purified gas.

[0005] [Problems to be Solved by the Invention]

However, as described below, fly ash treatment has the following problems. (1) Twice the amount of chemical agents are required, since heating is performed at high temperatures inside the ash melting furnace, which means that hydrogen chloride is produced when reacted salts and the like are re-gasificated and is emitted together with exhaust gas, thereby requiring the collection by the ash melting furnace-side dust collector 9 after chemical agents are once again placed in the exhaust gas.

Furthermore, in fly ash treatment, (2) some of the salts in the fly ash form molten salt inside the ash melting furnace 7, which erodes the fire resistant bricks inside the furnace, reducing its lifespan. furthermore, if water-granulated slag is created, some of the salts may elutriate, preventing release into the water system, and requiring further detoxification.

(3) If the calcium content in the fly ash is significant due to the slaked lime, the basicity ( $\text{CaO/SiO}$ ) thereof grows, thereby

limiting melting methods since the melting temperature increases, and also erosion of the fireproof bricks accelerates, the amount of heat energy consumed for melting the ash increases, and operating costs grow.

[0006] The present invention solves the above problems and has as an object to provide a device for treating incinerator fly ash without increasing the amount of added chemical agents, preventing production of salts inside an ash melting furnace, preventing erosion of fireproof bricks, rendering unnecessary wastewater drainage treatment, not requiring a high melting point, and being able to reduce operating costs.

[0007] [Means for Solving the Problems]

In order to solve these problems, a first means according to the present invention is such that an incinerator-side dust collector and a wet gas washer are disposed along an exhaust path of incinerator exhaust gas emitted from an incinerator body in order from the incinerator body side, an ash melting furnace for heating and melting fly ash that is caught and supplied by the incinerator-side dust collector and an ash melting furnace-side dust collector for collecting fly ash from melted exhaust gas emitted from the ash melting furnace are provided, and a combined exhaust gas pipe that introduces melted exhaust gas that is emitted from the ash melting furnace-side dust collector into an inlet of the wet gas washer.

[0008] Furthermore, a second means is the first means, wherein

the incinerator-side dust collector is a dry filtration dust collector, and only auxiliary agents and activated carbon in the exhaust gas are blown into the inlet by the dry filtration dust collector, thereby collecting dioxin and fly ash.

[0009] Furthermore, a third means is the second means, wherein a denitrating device is provided to the exhaust gas outlet of the wet gas washer with an exhaust gas reheater, which has as a heating source a heat transfer medium of a boiler that is attached to the incinerator body interposed therebetween.

[0010] A fourth means is the first means, wherein the incinerator-side dust collector is an electrostatic dust collector, and a dry filtration dust collector for collecting dioxin that collects dioxin is disposed to the exhaust gas outlet of the wet gas washer, only auxiliary agents and activated carbon being blown in through the inlet.

[0011] Furthermore, a fifth means is the fourth means, wherein a denitrating device is interposed between the electrostatic dust collector and the wet gas washer. Furthermore, a sixth means is any one of the first through fifth means, wherein a main ash supply apparatus that supplies main ash that is emitted from the incinerator body to the ash melting furnace is provided and fly ash is heated and melted together with the main ash in the ash melting furnace.

[0012] [Operation]

With the first constitution, by using a wet gas washer to



collect toxic gas components such as low-boiling-point heavy metals and hydrogen chloride contained inside combustion exhaust gas emitted from the incinerator body, the incinerator-side dust collector is used to collect fly ash that does not contain salts produced by the toxic gas components, which is heated and melted in the ash melting furnace, and thereby hydrogen chloride is not generated during melting of the ash in the ash melting incinerator, and it is possible to render unnecessary introduction of chemical agents for collecting hydrogen chloride into the molten exhaust gas. Since salts are not elutriated, the lifespan of the fireproof bricks is not shortened, and if water-granulated slag is created, it can be released into the water system without elutriating salts into the cooled water. Furthermore, since the calcium content of the fly ash is low, various melting methods can be used since the melting temperature does not rise, which can contribute to a reduction in operating costs. Because of this, the volume of fly ash can be reduced.

[0013] Furthermore, because the molten gas after dust collection is merged into the inlet of the wet gas washer installed along the exhaust path of the incinerator exhaust gas, no toxic substance eliminating apparatus specifically for the molten exhaust gas is required, thereby making it possible to reduce equipment costs.

[0014] With the second constitution, dioxin can be collected together with the fly ash by the incinerator-side dust collector, further boosting detoxification of the exhaust gas. With the third

constitution, the heat transfer medium of the boiler that is installed in the incinerator body is used to heat the exhaust gas, which has fallen in temperature due to the wet gas washer, to a temperature suitable for denitrating, and therefore waste heat can be used efficiently, and nitrogen oxides can be removed from the exhaust gas without increasing operating costs.

[0015] With the fourth constitution, the dust collector for collecting fly ash in the incinerator exhaust gas is an electrostatic dust collector, thereby making it possible to collect fly ash by introducing exhaust gas into the dust collector without the temperature falling, which, compared to disposing a wet filtration dust collector which requires the temperature of the exhaust gas to be lowered, makes operation possible with greater heat efficiency and greater energy savings.

[0016] With the fifth constitution, molten exhaust gas, which has low temperature dropped after being emitted from the electrostatic dust collector, can be introduced directly into the denitrating apparatus, thereby making it possible to improve heat efficiency.

[0017] With the sixth constitution, the fly ash, to which no slaked lime has been added as a chemical agent, is heated and melted together with the main ash in the ash melting furnace, making it possible to melt all the ash emitted from the incinerator without producing hydrogen chloride or molten salts, thereby making it

possible to efficiently reduce volume.

[0018] [Embodiments]

A first embodiment of a waste incinerator according to the present invention is described below, with reference to FIG. 1. Note that the same reference numerals are given to the same members as in the conventional example, and description thereof is omitted.

[0019] The first embodiment is a simple fly ash melting system, and a first temperature adjusting tower 3, a bag filter 12 that constitutes the incinerator-side dry filtration dust collector, a wet gas washer 13, an exhaust gas reheater 14, and a catalytic denitrating apparatus 5 are disposed in order from the incinerator body along a combustion exhaust gas emission route 11 that emits combustion exhaustion gas from the incinerator body 1. A second temperature adjusting tower 23 and an ash melting incinerator-side dust collector 24 are interposed along a molten exhaust gas emission route 22 that emits molten exhaust gas from an ash melting furnace 21 that melts fly ash.

[0020] The bag filter 12 is such that only activated carbon and an auxiliary agent are blown in as chemical agents immediately before the inlet in the combustion exhaust gas that is cooled to a combustion exhaust gas temperature that is suitable for capturing dioxin, namely 200 °C or less, or preferably cooled to 150-170 °C, by the first temperature adjusting tower 3. The auxiliary agent is for increasing air permeability as a precoat for filter cloth in the bag

filter, thereby preventing burnout, and a powder is used that has diatomaceous earth as a main component. Accordingly, since no slaked lime ( $\text{Ca}(\text{OH})_2$ ) is included in the chemical agents that are blown into the combustion exhaustion gas, fly ash is collected which contains almost no calcium chloride ( $\text{CaCl}_2$ ) or unreacted chemical agent ( $\text{Ca}(\text{OH})_2$ ), which are reaction products.

[0021] The wet gas washer 12 treats the combustion exhaust gas after dust collection and molten exhaust gas which is described below, and elutriates water-soluble components by dispersing water in the exhaust gas, as well as coagulating metals in the exhaust gas by lowering the temperature of the exhaust gas, and thereby removing  $\text{HCl}$ ,  $\text{SO}_x$ ,  $\text{Hg}$ , and other compounds from the exhaust gas. A wastewater treating apparatus 15 separates out and removes the aqueous solution containing the drained  $\text{HCl}$ ,  $\text{SO}_x$ ,  $\text{Hg}$ , and other compounds using publicly known technologies.

[0022] The exhaust gas reheater 14 uses heat transfer medium steam obtained from the boiler 2 to raise the temperature of the exhaust gas, which has been lowered by the wet gas washer 12, to a temperature suitable for denitrating using a catalyst, namely approximately  $210\text{ }^\circ\text{C}$ , before introduction into the catalytic denitrating apparatus 5.

[0023] The ash melting furnace 21 forms slag by heating and melting fly ash that is collected by the first temperature adjusting tower 3 and the bag filter 12 and carried by a fly ash delivery

apparatus 25 comprising a scraper conveyor apparatus, the ash melting furnace 21 that is used being either a burner type or an electric type (arc type, plasma type, electric resistance type, etc.). Since the fly ash contains almost no calcium chloride ( $\text{CaCl}_2$ ) or other reaction products of slaked lime, no hydrogen chloride is reproduced, and erosion of fireproof bricks does not increase due to the formation of molten salts.

[0024] The melting furnace-side dust collector 24 into which molten exhaust gas which has been cooled by the second temperature adjusting tower 23 need only be compactly constitutable, such as a cyclone-type, an electrostatic-type, or a dry filtration-type. With a melting furnace-side dust collector 24 that comprises a bag filter, dust is collected that contains low-boiling point metals dispersed during melting, such as, for example, mercury, lead, and zinc, and these are treated by the detoxification apparatus 26.

[0025] The molten exhaust gas that is emitted from the melting furnace-side dust collector 24 is introduced through the inlet of the wet gas washer 13 via a combined exhaust gas pipe 27 that is provided to the combined exhaust gas route, and treated together with combustion exhaust gas.

[0026] With the above constitution, combustion exhaust gas produced by the incinerator body 1 undergoes heat collection by the boiler 2, is cooled by the first temperature adjusting tower 3, and is introduced into the bag filter 12. The fly ash that is collected

by the filter cloth of the bag filter 12 and the fly ash that is collected in the first temperature adjusting tower 3 are delivered to the ash melting furnace 21 by the fly ash delivering apparatus 25. This is heated and melted by the ash melting furnace 21, thereby forming slag and reducing the volume, and at the same time dioxin undergoes thermal decomposition at high temperature, while the slag is reused or disposed in a landfill or the like. The molten exhaust gas that is generated in the ash melting furnace 21 is introduced into the wet gas washer 13 via the combined exhaust gas pipe 27 after low-boiling point metals are collected by the ash melting furnace-side dust collector 24 that is disposed along the molten exhaust gas emission route 22, and treated together with combustion exhaust gas. The dust and fly ash collected by the ash melting furnace-side dust collector 24 and in the second temperature adjusting tower 23 undergoes detoxification using either cement solidification or chelation by a dust detoxification apparatus 26, and is disposed of. In the wet gas washer 13, chlorine gas, sulfides, mercury, and the like that are contained in the combustion exhaust gas and the molten exhaust gas are collected, and an aqueous solution containing these is treated by a wastewater treating apparatus 15. Furthermore, exhaust gas that has been heated by the exhaust gas reheater 14 is emitted as purified gas from the chimney 6 after nitrogen oxides have been removed by the catalytic denitrating apparatus 15.

[0027] With the first embodiment, the wet gas washer 13 collects

toxic gas components including low-boiling point metals, hydrogen chloride, and the like that are contained in the combustion exhaustion gas that is emitted from the incinerator body 1, only an auxiliary agent and activated gas are blown into the combustion exhaustion gas at the inlet and the bag filter 12 collects dioxin and fly ash that does not contain salts that does not contain salts [sic] generated by toxic gas components, and this is heated and melted by the ash melting furnace 21. Therefore, no hydrogen chloride or molten salts are produced during ash melting, making the introduction of chemical agents in order to collect hydrogen chloride from the molten exhaust gas unnecessary, and thereby not reducing the lifespan of the fireproof bricks due to an increase in the amount of erosion by molten salts. Furthermore, even in a case in which water-granulated slag is created from the molten ash, no molten salt is mixed into the cooled water, and therefore the cooled water can be released into the water system without undergoing detoxification. Moreover, due to the low level of calcium in the fly ash, the melting temperature of the fly ash does not increase, and therefore there is no need to use high-temperature specifications for the ash melting furnace or the material of the fireproof bricks, and erosion of the fireproof bricks is small. Accordingly, the volume of the fly ash can be reduced, thereby contributing to a reduction in equipment costs and operating costs, as well as reducing the frequency of maintenance.

[0028] Furthermore, since the molten exhaust gas that is

collected by a second bag filter 24 [sic] is introduced into the wet gas washer 13 via the combined exhaust gas pipe 27 and treated together with the combustion exhaust gas, no toxic matter removal apparatus specifically for the molten exhaust gas is required, making it possible to reduce equipment costs. The bag filter 12 collects fly ash and dioxin, the wet gas washer 13 removes HCl, SO<sub>x</sub>, Hg in the light from the exhaust gas, and the catalytic denitrating apparatus 5 removes NO<sub>x</sub>, thereby making it possible to detoxify the gas. The exhaust gas, whose temperature has dropped because of the wet gas washer 13, is raised to a temperature suitable for denitrating using the exhaust gas reheater 14 by utilizing the heat transfer medium of the boiler that is installed in the incinerator body, and therefore waste heat can be efficiently recycled without increasing operating costs.

[0029] FIG. 2 shows a second embodiment of a mixing and melting system for main ash and fly ash, utilizing the first embodiment. The main ash emitted by the incinerator body 1 is water-cooled by the ash treating apparatus 31 or cooled by water mist that is dispersed therein. In the case of water-cooling, [the main ash] is introduced into a drying apparatus 32 and dried, and then delivered to the ash melting furnace 21 by a main ash delivering apparatus 33 that comprises a scraper conveyor, and is heated and melted together with the fly ash. If the main ash has been cooled using a water mist, then it is delivered directly to the ash melting furnace 21 by the main



ash delivering apparatus 33.

[0030] Dust in the dry exhaust gas that is emitted from the drying apparatus 32 when drying the main ash is collected by a dry exhaust gas purifying apparatus 34 using a cyclone-type dust collector 34a for large dust particles and a bag filter 35b for fine dust particles, after which the dry exhaust gas passes through a dry exhaust gas emission pipe 36 that is disposed along a dry exhaust gas emission route and between the boiler 2 of the combustion exhaust gas route 11 and the first temperature adjusting tower 3, and thereby combined with the combustion exhaust gas.

[0031] With this second embodiment, no hydrogen chloride or molten salts are produced during melting of the ash, and therefore the same effect as in the first embodiment can be provided, and also the fly ash can be melted simultaneously with the main ash, making a reduction in equipment costs possible as well as melting of the fly ash using an existing ash melting furnace.

[0032] FIG. 3 shows a third embodiment of a simple fly ash melting system having as an object energy conservation. The third embodiment solves the problem of the temperature of the high-temperature combustion exhaust gas that is emitted from the incinerator body 1 via the boiler 2 having to be cooled by the first temperature adjusting tower 3, by using an electric dust collector (electromagnetic dust collector) 42 whereby fly ash can be collected from high-temperature exhaust gas, thereby improving heat efficiency.

[0033] In other words, the electric dust collector (electrostatic dust collector) 42, the catalytic denitrating apparatus 5, a wet gas washer 13, and exhaust gas reheater 43, and a bag filter 44 for capturing dioxin are disposed along the emission route 41 of the combustion exhaust gas, in this order from the incinerator body 1.

[0034] In the above configuration, the combustion exhaustion gas that is emitted from the incinerator body 1 undergoes heat recovery in the boiler 2, is introduced to the electric dust collector 42 where fly ash is recovered, and is then introduced into the catalytic denitrating apparatus 5, where nitrogen oxides are removed. The fly ash that is collected by the electric dust collector 42 is delivered to the ash melting furnace 21 by the fly ash delivery apparatus 25. The fly ash is heated and melted in the ash melting furnace 21, thereby forming slag and reducing the volume thereof, after which it is reused or disposed in a landfill. The molten exhaust gas that is generated in the ash melting furnace 21 is introduced into the wet gas washer 13 via the combined exhaust gas pipe 27 along the combined exhaust gas route after low-boiling point metals are collected by the ash melting furnace-side dust collector 24 that is disposed along the molten exhaust gas emission route 22, and treated together with combustion exhaust gas. The dust that is collected by the gas melting furnace-side dust collector 24 is either detoxified using cement solidification or chelation or treated by the ash detoxification

apparatus 26 and disposed of. In the wet gas washer 13, chlorine gas, sulfides, mercury, and the like that are contained in the combustion exhaust gas and the molten exhaust gas are collected, and an aqueous solution containing these is treated by a wastewater treating apparatus 15. Furthermore, exhaust gas which has been heated by the exhaust gas reheater 43 is introduced into the bag filter 44 for collecting dioxin. Dioxin is adsorbed by the auxiliary agent and activated carbon that are blown in through the inlet, and removed by the filter cloth. The dioxin and fly ash which have been collected pass through a fly ash collecting pipe 45 and are introduced into the ash melting furnace 21, and the dioxin undergoes thermal decomposition due to the melting heat. The exhaust gas is emitted from the chimney 6 as purified gas.

[0035] With the third embodiment, the ash that is collected by the electric dust collector 42 does not contain any reacted salts or unreacted chemical agents, and therefore the same effect can be provided as in the first embodiment, since no hydrogen chloride or molten salts are produced during melting by the ash melting furnace 21.

[0036] Since the electric dust collector 42 is disposed at the outlet of the incinerator body 1, cooling of the combustion exhaust gas by the first temperature adjusting tower 3 required for the dry filtration dust collector is unnecessary. Furthermore, the temperature of the exhaust gas at the outlet of the electric dust

collector 42 is 230-200 °C [sic], and therefore the combustion exhaust gas can be introduced directly into the catalytic denitrating apparatus 54 denitrating, without heating the exhaust gas with the exhaust gas reheater as in the first embodiment. Accordingly, heat efficiency can be improved and energy can be saved.

[0037] Note that in the third embodiment, exhaust gas that is emitted from the wet gas washer 13 is heated by the exhaust gas reheater 43 and thereby de-humidified before being introduced into the bag filter 44 for dioxin capturing, but the rise in temperature of the exhaust gas by the exhaust gas reheater 44 need only be around 140-150 °C, suitable for removing dioxin and capable of preventing white smoke. Therefore, the temperature may be significantly lower than the heating temperature of 210 °C by the exhaust gas reheater 14 in the first embodiment.

[0038] FIG. 4 shows a mixing and melting system for main ash and fly ash in which the second embodiment has been added to the third embodiment, and the effects indicated by the second embodiment and the third embodiment can be provided.

[0039] [Effects of the Invention]

As described above, with the first constitution of the present invention, by using a wet gas washer to collect toxic gas components such as low-boiling-point heavy metals and hydrogen chloride contained inside combustion exhaust gas emitted from the incinerator body, the incinerator-side dust collector is used to collect fly ash

that does not contain salts produced by the toxic gas components, which is heated and melted in the ash melting furnace, and thereby hydrogen chloride is not generated during melting of the ash in the ash melting incinerator, and it is possible to render unnecessary introduction of chemical agents for collecting hydrogen chloride into the molten exhaust gas. Since salts are not elutriated, the lifespan of the fireproof bricks is not shortened, and if water-granulated slag is created, it can be released into the water system without elutriating salts into the cooled water. Furthermore, since the calcium content of the fly ash is low, various melting methods can be used since the melting temperature does not rise, which can contribute to a reduction in operating costs. Because of this, the volume of fly ash can be reduced.

[0040] Furthermore, because the molten gas after dust collection is merged into the inlet of the wet gas washer installed along the exhaust path of the incinerator exhaust gas, no toxic substance eliminating apparatus specifically for the molten exhaust gas is required, thereby making it possible to reduce equipment costs.

[0041] With the second constitution, dioxin can be collected together with the fly ash by the incinerator-side dust collector, further boosting detoxification of the exhaust gas. With the third constitution, the heat transfer medium of the boiler that is installed in the incinerator body is used to heat the exhaust gas, which has fallen in temperature due to the wet gas washer, to a

temperature suitable for denitrating, and therefore waste heat can be used efficiently, and nitrogen oxides can be removed from the exhaust gas without increasing operating costs.

[0042] With the fourth constitution, the dust collector for collecting fly ash in the incinerator exhaust gas is an electrostatic dust collector, thereby making it possible to collect fly ash by introducing exhaust gas into the dust collector without the temperature falling, which, compared to disposing a wet filtration dust collector which requires the temperature of the exhaust gas to be lowered, makes operation possible with greater heat efficiency and greater energy savings.

[0043] With the fifth constitution, molten exhaust gas which has low temperature dropped after being emitted from the electrostatic dust collector can be introduced directly into the denitrating apparatus, thereby making it possible to improve heat efficiency.

[0044] With the sixth constitution, the fly ash, to which no slaked lime has been added as a chemical agent, is heated and melted together with the main ash in the ash melting furnace, making it possible to melt all the ash emitted from the incinerator without producing hydrogen chloride or molten salts, thereby making it possible to efficiently reduce volume.

[Brief Description of the Drawings]

[FIG. 1] is a block diagram showing a constitution a first embodiment of a waste incinerator according to the present invention.

[FIG. 2] is a block diagram showing a constitution a second embodiment of a waste incinerator according to the present invention.

[FIG. 3] is a block diagram showing a constitution a third embodiment of a waste incinerator according to the present invention.

[FIG. 4] is a block diagram showing a constitution a fourth embodiment of a waste incinerator according to the present invention.

[FIG. 5] is a block diagram showing a constitution of a conventional waste incinerator.

[Explanation of Reference Numbers]

- 1 incinerator body
- 2 boiler
- 3 first temperature adjusting tower (temperature adjusting tower)
- 5 catalytic denitrating apparatus
- 6 chimney
- 11 molten exhaust gas emission route
- 12 bag filter
- 13 wet gas washer
- 14 exhaust gas reheater
- 21 ash melting furnace
- 22 molten exhaust gas emission route
- 23 second temperature adjusting tower
- 24 ash melting furnace-side dust collector
- 25 fly ash delivery apparatus
- 27 combined exhaust gas pipe

- 31 ash treating apparatus
- 32 drying apparatus
- 33 main ash delivery apparatus
- 34 dry exhaust gas purifying apparatus
- 35 dry exhaust gas emission route
- 41 combustion exhaust gas emission route
- 42 electric dust collector
- 43 exhaust gas reheater
- 44 dioxin collecting bag filter



FIG. 1

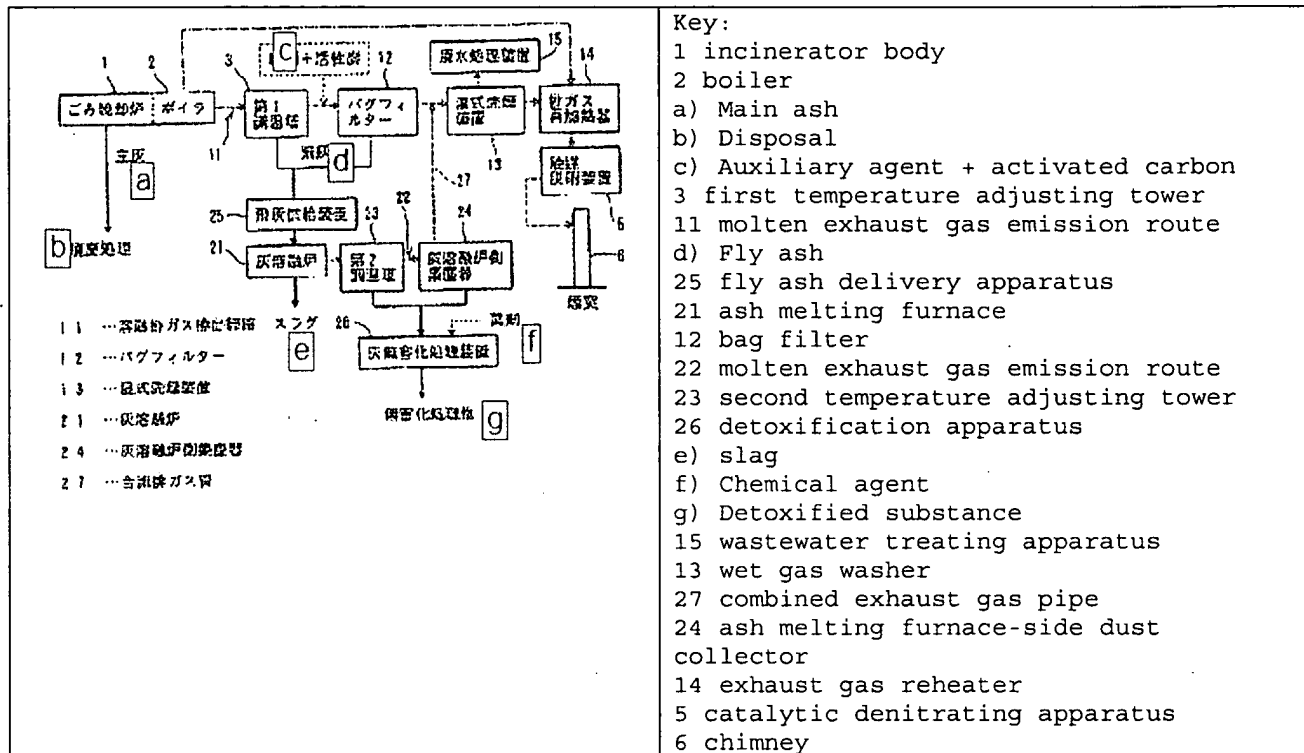
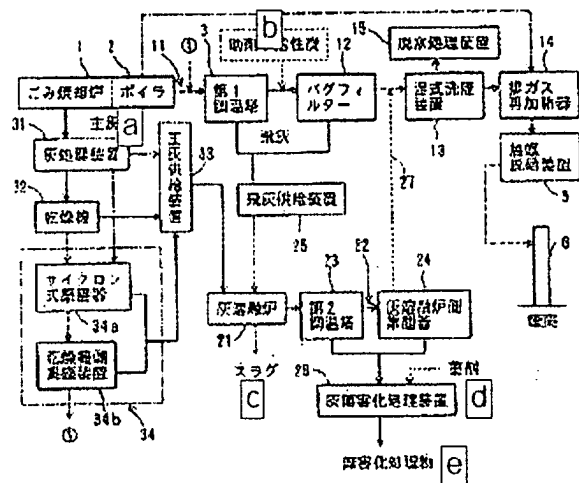


FIG. 2

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## Key:

- 1 incinerator body
- 2 boiler
- a) Main ash
- 31 ash treating apparatus
- 32 drying apparatus
- 34a cyclone-type dust collector
- 34b drier-side dust collector [sic (not mentioned in description)]
- 34 dry exhaust gas purifying apparatus
- 33 main ash delivery apparatus
- 11 molten exhaust gas emission route
- b) Auxiliary agent + activated carbon
- 3 first temperature adjusting tower
- 25 fly ash delivery apparatus
- 21 ash melting furnace
- c) Slag
- 12 bag filter
- 22 molten exhaust gas emission route
- 23 second temperature adjusting tower
- 26 detoxification apparatus
- 15 wastewater treating apparatus
- 13 wet gas washer
- 27 combined exhaust gas pipe
- 24 ash melting furnace-side dust collector
- d) Chemical agent
- 26 detoxification apparatus
- e) Detoxified substance
- 14 exhaust gas reheater
- 5 catalytic denitrating apparatus
- 6 chimney

FIG. 3

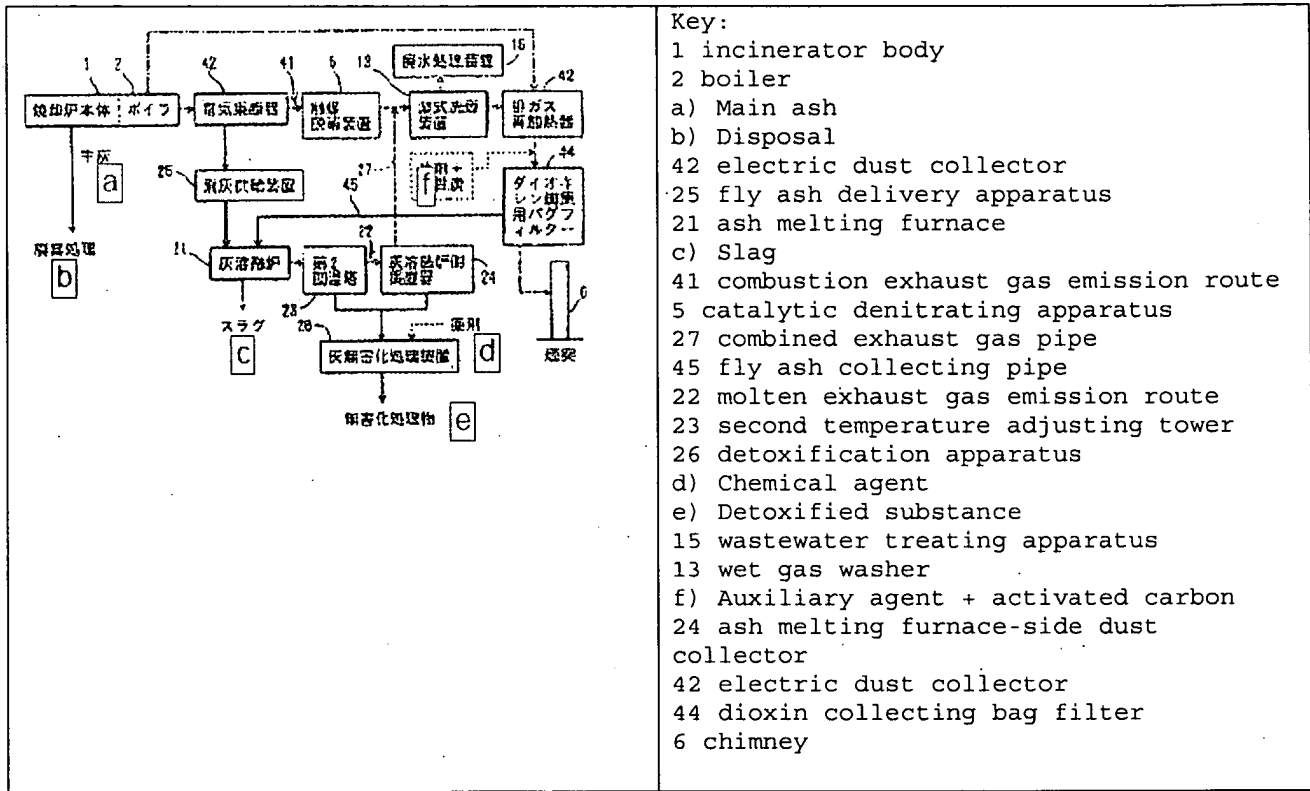


FIG. 4

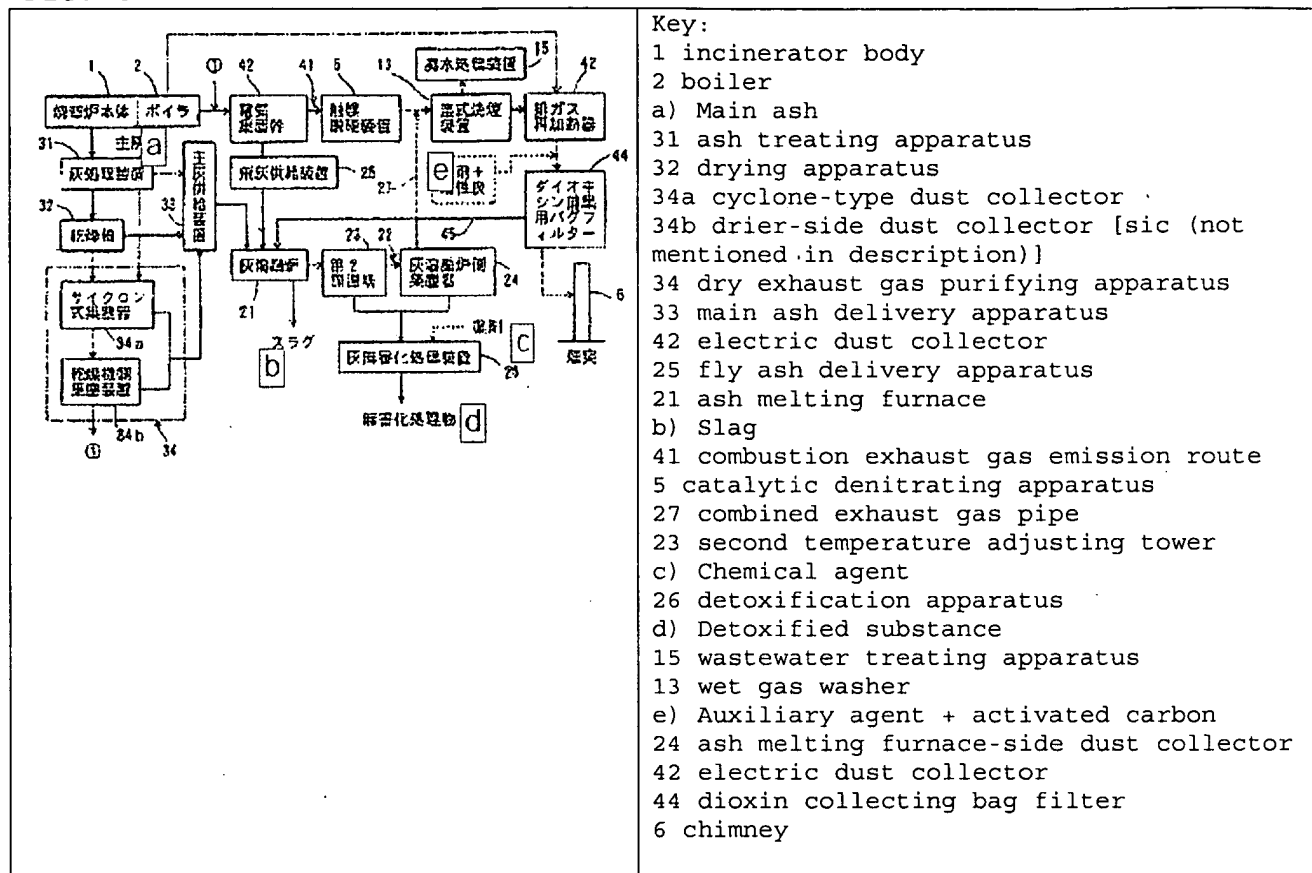


FIG. 5

